

SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANT: Better, Marc D.
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- (ii) TITLE OF INVENTION: Immunotoxins Comprising Ribosome-Inactivating Proteins
- (iii) NUMBER OF SEQUENCES: 169
- (iv) CORRESPONDENCE ADDRESS:
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(F) ZIP: 60661
- (v) COMPUTER READABLE FORM:
(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.25
- (vi) CURRENT APPLICATION DATA:
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(B) FILING DATE: 15-APR-1997
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- (vii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: US 08/425,336
(B) FILING DATE: 18-APR-1995
- (viii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: US 08/064,691
(B) FILING DATE: 12-MAY-1993
- (ix) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: US 07/988,430
(B) FILING DATE: 09-DEC-1992
- (x) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: US 07/901,707
(B) FILING DATE: 19-JUN-1992
- (xi) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: US 07/787,567
(B) FILING DATE: 04-NOV-1991
- (xii) ATTORNEY/AGENT INFORMATION:
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(C) REFERENCE/DOCKET NUMBER: 11022US09/200-70.P3.C3

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(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 267 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Ile Phe Pro Lys Gln Tyr Pro Ile Ile Asn Phe Thr Thr Ala Gly Ala
1 5 10 15

Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg Gly Arg Leu
 20 25 30

Thr Thr Gly Ala Asp Val Arg His Glu Ile Pro Val Leu Pro Asn Arg
35 40 45

Val Gly Leu Pro Ile Asn Gln Arg Phe Ile Leu Val Glu Leu Ser Asn
50 55 60

His Ala Glu Leu Ser Val Thr Leu Ala Leu Asp Val Thr Asn Ala Tyr
65 70 75 80

Val Val Gly Tyr Arg Ala Gly Asn Ser Ala Tyr Phe Phe His Pro Asp
85 90 95

Asn Gln Glu Asp Ala Glu Ala Ile Thr His Leu Phe Thr Asp Val Gln
100 105 110

Asn Arg Tyr Thr Phe Ala Phe Gly Gly Asn Tyr Asp Arg Leu Glu Gln
115 120 125

Leu Ala Gly Asn Leu Arg Glu Asn Ile Glu Leu Gly Asn Gly Pro Leu
130 135 140 .

Glu Glu Ala Ile Ser Ala Leu Tyr Tyr Tyr Ser Thr Gly Gly Thr Gln
145 150 155 160

Leu Pro Thr Leu Ala Arg Ser Phe Ile Ile Cys Ile Gln Met Ile Ser
165 170 175

Glu Ala Ala Arg Phe Gln Tyr Ile Glu Gly Glu Met Arg Thr Arg Ile
180 185 190

Arg Tyr Asn Arg Arg Ser Ala Pro Asp Pro Ser Val Ile Thr Leu Glu
195 200 205

Asn Ser Trp Gly Arg Leu Ser Thr Ala Ile Gln Glu Ser Asn Gln Gly
210 215 220

Ala Phe Ala Ser Pro Ile Gln Leu Gln Arg Arg Asn Gly Ser Lys Phe
225 230 235 240

Ser Val Tyr Asp Val Ser Ile Leu Ile Pro Ile Ile Ala Leu Met Val
245 250 255

Tyr Arg Cys Ala Pro Pro Pro Ser Ser Gln Phe
260 265

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 251 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Gly Leu Asp Thr Val Ser Phe Ser Thr Lys Gly Ala Thr Tyr Ile Thr
1 5 10 15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly
35 40 45

Lys Cys Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala

50

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Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Asp Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 280 amino acids

(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Ala Ala Lys Met Ala Lys Asn Val Asp Lys Pro Leu Phe Thr Ala Thr
1 5 10 15

Phe Asn Val Gln Ala Ser Ser Ala Asp Tyr Ala Thr Phe Ile Ala Gly
20 25 30

Ile Arg Asn Lys Leu Arg Asn Pro Ala His Phe Ser His Asn Arg Pro
35 40 45

Val Leu Pro Pro Val Glu Pro Asn Val Pro Pro Ser Arg Trp Phe His
50 55 60

Val Val Leu Lys Ala Ser Pro Thr Ser Ala Gly Leu Thr Leu Ala Ile
65 70 75 80

Arg Ala Asp Asn Ile Tyr Leu Glu Gly Phe Lys Ser Ser Asp Gly Thr
85 90 95

Trp Trp Glu Leu Thr Pro Gly Leu Ile Pro Gly Ala Thr Tyr Val Gly
100 105 110

Phe Gly Gly Thr Tyr Arg Asp Leu Leu Gly Asp Thr Asp Lys Leu Thr
115 120 125

Asn Val Ala Leu Gly Arg Gln Gln Leu Ala Asp Ala Val Thr Ala Leu
130 135 140

His Gly Arg Thr Lys Ala Asp Lys Ala Ser Gly Pro Lys Gln Gln Gln
145 150 155 160

Ala Arg Glu Ala Val Thr Thr Leu Val Leu Met Val Asn Glu Ala Thr
165 170 175

Arg Phe Gln Thr Val Ser Gly Phe Val Ala Gly Leu Leu His Pro Lys
180 185 190

Ala Val Glu Lys Lys Ser Gly Lys Ile Gly Asn Glu Met Lys Ala Gln
195 200 205

Val Asn Gly Trp Gln Asp Leu Ser Ala Ala Leu Leu Lys Thr Asp Val
210 215 220

Lys Pro Pro Pro Gly Lys Ser Pro Ala Lys Phe Ala Pro Ile Glu Lys
225 230 235 240

Met Gly Val Arg Thr Ala Glu Gln Ala Ala Asn Thr Leu Gly Ile Leu
245 250 255

Leu Phe Val Glu Val Pro Gly Gly Leu Thr Val Ala Lys Ala Leu Glu
260 265 270

Leu Phe His Ala Ser Gly Gly Lys
275 280

(2) INFORMATION FOR SEQ ID NO:4:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 263 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Asp Val Asn Phe Asp Leu Ser Thr Ala Thr Ala Lys Thr Tyr Thr Lys
1 5 10 15

Phe Ile Glu Asp Phe Arg Ala Thr Leu Pro Phe Ser His Lys Val Tyr
20 25 30

Asp Ile Pro Leu Leu Tyr Ser Thr Ile Ser Asp Ser Arg Arg Phe Ile
35 40 45

Leu Leu Asp Leu Thr Ser Tyr Ala Tyr Glu Thr Ile Ser Val Ala Ile
50 55 60

Asp Val Thr Asn Val Tyr Val Val Ala Tyr Arg Thr Arg Asp Val Ser
65 70 75 80

Tyr Phe Phe Lys Glu Ser Pro Pro Glu Ala Tyr Asn Ile Leu Phe Lys

85

90

95

Gly Thr Arg Lys Ile Thr Leu Pro Tyr Thr Gly Asn Tyr Glu Asn Leu
100 105 110

Gln Thr Ala Ala His Lys Ile Arg Glu Asn Ile Asp Leu Gly Leu Pro
115 120 125

Ala Leu Ser Ser Ala Ile Thr Thr Leu Phe Tyr Tyr Asn Ala Gln Ser
130 135 140

Ala Pro Ser Ala Leu Leu Val Leu Ile Gln Thr Thr Ala Glu Ala Ala
145 150 155 160

Arg Phe Lys Tyr Ile Glu Arg His Val Ala Lys Tyr Val Ala Thr Asn
165 170 175

Phe Lys Pro Asn Leu Ala Ile Ile Ser Leu Glu Asn Gln Trp Ser Ala
180 185 190

Leu Ser Lys Gln Ile Phe Leu Ala Gln Asn Gln Gly Gly Lys Phe Arg
195 200 205

Asn Pro Val Asp Leu Ile Lys Pro Thr Gly Glu Arg Phe Gln Val Thr
210 215 220

Asn Val Asp Ser Asp Val Val Lys Gly Asn Ile Lys Leu Leu Leu Asn
225 230 235 240

Ser Arg Ala Ser Thr Ala Asp Glu Asn Phe Ile Thr Thr Met Thr Leu
245 250 255

Leu Gly Glu Ser Val Val Asn
260

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 248 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Asp	Val	Arg	Phe	Ser	Leu	Ser	Gly	Ser	Ser	Ser	Thr	Ser	Tyr	Ser	Lys
1				5					10					15	

Phe Ile Gly Asp Leu Arg Lys Ala Leu Pro Ser Asn Gly Thr Val Tyr
20 25 30

Asn Leu Thr Ile Leu Leu Ser Ser Ala Ser Gly Ala Ser Arg Tyr Thr
 35 40 45

Leu Met Thr Leu Ser Asn Tyr Asp Gly Lys Ala Ile Thr Val Val
50 55 60

Asp Val Ser Gln Leu Tyr Ile Met Gly Tyr Leu Val Asn Ser Thr Ser
65 70 75 80

Tyr Phe Phe Asn Glu Ser Asp Ala Lys Leu Ala Ser Gln Tyr Val Phe
85 90 95

Lys Gly Ser Thr Ile Val Thr Leu Pro Tyr Ser Gly Asn Tyr Glu Lys
 100 105 110

Leu Gln Thr Ala Ala Gly Lys Ile Arg Glu Lys Ile Pro Leu Gly Phe
115 120 . 125

Pro Ala Leu Asp Ser Ala Leu Thr Thr Ile Phe His Tyr Asp Ser Thr
 130 135 140

Ala Ala Ala Ala Ala Phe Leu Val Ile Leu Gln Thr Thr Ala Glu Ala
145 150 155 160

Ser Arg Phe Lys Tyr Ile Glu Gly Gln Ile Ile Glu Arg Ile Ser Lys
165 170 175

Asn Gln Val Pro Ser Leu Ala Thr Ile Ser Leu Glu Asn Ser Leu Trp
180 185 190

Ser Ala Leu Ser Lys Gln Ile Gln Leu Ala Gln Thr Asn Asn Gly Thr
195 200 205

Phe Lys Thr Pro Val Val Ile Thr Asp Asp Lys Gln Gln Arg Val Glu
210 215 220

Ile Thr Asn Val Thr Ser Lys Val Val Thr Lys Asn Ile Gln Leu Leu
225 230 235 240

Leu Asn Tyr Lys Gln Asn Val Ala
245

(2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 247 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

Asp Val Ser Phe Arg Leu Ser Gly Ala Thr Ser Ser Ser Tyr Gly Val
1 5 10 15

Phe Ile Ser Asn Leu Arg Lys Ala Leu Pro Asn Glu Arg Lys Leu Tyr
20 25 30

Asp Ile Pro Leu Leu Arg Ser Ser Leu Pro Gly Ser Gln Arg Tyr Ala
35 40 45

Leu Ile His Leu Thr Asn Tyr Ala Asp Glu Thr Ile Ser Val Ala Ile
50 55 60

Asp Val Thr Asn Val Tyr Ile Met Gly Tyr Arg Ala Gly Asp Thr Ser
65 70 75 80

Tyr Phe Phe Asn Glu Ala Ser Ala Thr Glu Ala Ala Lys Tyr Val Phe
85 90 95

Lys Asp Ala Met Arg Lys Val Thr Leu Pro Tyr Ser Gly Asn Tyr Glu
100 105 110

Arg Leu Gln Thr Ala Ala Gly Lys Ile Arg Glu Asn Ile Pro Leu Gly
115 120 125

Leu Pro Ala Leu Asp Ser Ala Ile Thr Thr Leu Phe Tyr Tyr Asn Ala
130 135 140

Asn Ser Ala Ala Ser Ala Leu Met Val Leu Ile Gln Ser Thr Ser Glu
145 150 160

Ala Ala Arg Tyr Lys Phe Ile Glu Gln Gln Ile Gly Lys Arg Val Asp
165 170 175

Lys Thr Phe Leu Pro Ser Leu Ala Ile Ile Ser Leu Glu Asn Ser Trp
180 185 190

Ser Ala Leu Ser Lys Gln Ile Gln Ile Ala Ser Thr Asn Asn Gly Gln
195 200 205

Phe Glu Ser Pro Val Val Leu Ile Asn Ala Gln Asn Gln Val Ala Thr
210 215 220

Ile Thr Asn Val Asp Ala Gly Val Val Thr Ser Asn Ile Ala Leu Leu
225 230 235 240

Leu Asn Arg Asn Asn Met Ala
245

(2) INFORMATION FOR SEQ ID NO:7:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 263 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Asp Val Ser Phe Arg Leu Ser Gly Ala Asp Pro Arg Ser Tyr Gly Met
1 5 10 15

Phe Ile Lys Asp Leu Arg Asn Ala Leu Pro Phe Arg Glu Lys Val Tyr
20 25 30

Asn Ile Pro Leu Leu Leu Pro Ser Val Ser Gly Ala Gly Arg Tyr Leu
35 40 45

Leu Met His Leu Phe Asn Tyr Asp Gly Lys Thr Ile Thr Val Ala Val
50 55 60

Asp Val Thr Asn Val Tyr Ile Met Gly Tyr Leu Ala Asp Thr Thr Ser
65 70 75 80

Tyr Phe Phe Asn Glu Pro Ala Ala Glu Leu Ala Ser Gln Tyr Val Phe
85 90 95

Arg Asp Ala Arg Arg Lys Ile Thr Leu Pro Tyr Ser Gly Asn Tyr Glu
100 105 110

Arg Leu Gln Ile Ala Ala Gly Lys Pro Arg Glu Lys Ile Pro Ile Gly
115 120 125

Leu Pro Ala Leu Asp Ser Ala Ile Ser Thr Leu Leu His Tyr Asp Ser
130 135 140

Thr Ala Ala Ala Gly Ala Leu Leu Val Leu Ile Gln Thr Thr Ala Glu
145 150 155 160

Ala Ala Arg Phe Lys Tyr Ile Glu Gln Gln Ile Gln Glu Arg Ala Tyr
165 170 175

Arg Asp Glu Val Pro Ser Leu Ala Thr Ile Ser Leu Glu Asn Ser Trp
180 185 190

Ser Gly Leu Ser Lys Gln Ile Gln Leu Ala Gln Gly Asn Asn Gly Ile
195 200 205

Phe Arg Thr Pro Ile Val Leu Val Asp Asn Lys Gly Asn Arg Val Gln
210 215 220

Ile Thr Asn Val Thr Ser Lys Val Val Thr Ser Asn Ile Gln Leu Leu
225 230 235 240

Leu Asn Thr Arg Asn Ile Ala Glu Gly Asp Asn Gly Asp Val Ser Thr
245 250 255

Thr His Gly Phe Ser Ser Thr
260

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 250 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Ala Pro Thr Leu Glu Thr Ile Ala Ser Leu Asp Leu Asn Asn Pro Thr
1 5 10 15

Thr Tyr Leu Ser Phe Ile Thr Asn Ile Arg Thr Lys Val Ala Asp Lys
20 25 30

Thr Glu Gln Cys Thr Ile Gln Lys Ile Ser Lys Thr Phe Thr Gln Arg
35 40 45

Tyr Ser Tyr Ile Asp Leu Ile Val Ser Ser Thr Gln Lys Ile Thr Leu
50 55 60

Ala Ile Asp Met Ala Asp Leu Tyr Val Leu Gly Tyr Ser Asp Ile Ala
65 70 75 80

Asn Asn Lys Gly Arg Ala Phe Phe Phe Lys Asp Val Thr Glu Ala Val
85 90 95

Ala Asn Asn Phe Phe Pro Gly Ala Thr Gly Thr Asn Arg Ile Lys Leu
100 105 110

Thr Phe Thr Gly Ser Tyr Gly Asp Leu Glu Lys Asn Gly Gly Leu Arg
115 120 125

Lys Asp Asn Pro Leu Gly Ile Phe Arg Leu Glu Asn Ser Ile Val Asn
130 135 140

Ile Tyr Gly Lys Ala Gly Asp Val Lys Lys Gln Ala Lys Phe Phe Leu
145 150 155 160

Leu Ala Ile Gln Met Val Ser Glu Ala Ala Arg Phe Lys Tyr Ile Ser
165 170 175

Asp Lys Ile Pro Ser Glu Lys Tyr Glu Glu Val Thr Val Asp Glu Tyr
180 185 190

Met Thr Ala Leu Glu Asn Asn Trp Ala Lys Leu Ser Thr Ala Val Tyr
195 200 205

Asn Ser Lys Pro Ser Thr Thr Ala Thr Lys Cys Gln Leu Ala Thr
210 215 220

Ser Pro Val Thr Ile Ser Pro Trp Ile Phe Lys Thr Val Glu Glu Ile
225 230 235 240

Lys Leu Val Met Gly Leu Leu Lys Ser Ser
245 250

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 261 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Ile Asn Thr Ile Thr Phe Asp Ala Gly Asn Ala Thr Ile Asn Lys Tyr
1 5 10 15

Ala Thr Phe Met Glu Ser Leu Arg Asn Glu Ala Lys Asp Pro Ser Leu
20 25 30

Lys Cys Tyr Gly Ile Pro Met Leu Pro Asn Thr Asn Ser Thr Ile Lys
35 40 45

Tyr Leu Leu Val Lys Leu Gln Gly Ala Ser Leu Lys Thr Ile Thr Leu
50 55 60

Met Leu Arg Arg Asn Asn Leu Tyr Val Met Gly Tyr Ser Asp Pro Tyr
65 70 75 80

Asp Asn Lys Cys Arg Tyr His Ile Phe Asn Asp Ile Lys Gly Thr Glu

85

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Tyr Ser Asp Val Glu Asn Thr Leu Cys Pro Ser Ser Asn Pro Arg Val
100 105 110

Ala Lys Pro Ile Asn Tyr Asn Gly Leu Tyr Pro Thr Leu Glu Lys Lys
115 120 125

Ala Gly Val Thr Ser Arg Asn Glu Val Gln Leu Gly Ile Gln Ile Leu
130 135 140

Ser Ser Asp Ile Gly Lys Ile Ser Gly Gln Gly Ser Phe Thr Glu Lys
145 150 155 160

Ile Glu Ala Asp Phe Leu Leu Val Ala Ile Gln Met Val Ser Glu Ala
165 170 175

Ala Arg Phe Lys Tyr Ile Glu Asn Gln Val Lys Thr Asn Phe Asn Arg
180 185 190

Asp Phe Ser Pro Asn Asp Lys Val Leu Asp Leu Glu Glu Asn Trp Gly
195 200 205

Lys Ile Ser Thr Ala Ile His Asn Ser Lys Asn Gly Ala Leu Pro Lys
210 215 220

Pro Leu Glu Leu Lys Asn Ala Asp Gly Thr Lys Trp Ile Val Leu Arg
225 230 235 240

Val Asp Glu Ile Lys Pro Asp Val Gly Leu Leu Asn Tyr Val Asn Gly
245 250 255

Thr Cys Gln Ala Thr
260

(2) INFORMATION FOR SEQ ID NO:10:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 259 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Val Thr Ser Ile Thr Leu Asp Leu Val Asn Pro Thr Ala Gly Gln Tyr
1 5 10 15

Ser Ser Phe Val Asp Lys Ile Arg Asn Asn Val Lys Asp Pro Asn Leu
20 25 30

Lys Tyr Gly Gly Thr Asp Ile Ala Val Ile Gly Pro Pro Ser Lys Glu
35 40 45

Lys Phe Leu Arg Ile Asn Phe Gln Ser Ser Arg Gly Thr Val Ser Leu
50 55 60

Gly Leu Lys Arg Asp Asn Leu Tyr Val Val Ala Tyr Leu Ala Met Asp
65 70 75 80

Asn Thr Asn Val Asn Arg Ala Tyr Tyr Phe Arg Ser Glu Ile Thr Ser
85 90 95

Ala Glu Ser Thr Ala Leu Phe Pro Glu Ala Thr Thr Ala Asn Gln Lys
100 105 110

Ala Leu Glu Tyr Thr Glu Asp Tyr Gln Ser Ile Glu Lys Asn Ala Gln
115 120 125

Ile Thr Gln Gly Asp Gln Ser Arg Lys Glu Leu Gly Leu Gly Ile Asp
130 135 140

Leu Leu Ser Thr Ser Met Glu Ala Val Asn Lys Lys Ala Arg Val Val
145 150 155 160

Lys Asp Glu Ala Arg Phe Leu Leu Ile Ala Ile Gln Met Thr Ala Glu
165 170 175

Ala Ala Arg Phe Arg Tyr Ile Gln Asn Leu Val Ile Lys Asn Phe Pro
180 185 190

Asn Lys Phe Asn Ser Glu Asn Lys Val Ile Gln Phe Glu Val Asn Trp
195 200 205

Lys Lys Ile Ser Thr Ala Ile Tyr Gly Asp Ala Lys Asn Gly Val Phe

210

215

220

Asn Lys Asp Tyr Asp Phe Gly Phe Gly Lys Val Arg Gln Val Lys Asp
225 230 235 240

Leu Gln Met Gly Leu Leu Met Tyr Leu Gly Lys Pro Lys Ser Ser Asn
245 250 255

Glu Ala Asn

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 813 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

GGGCTAGATA CCGTGTCA TT CTCAACCAAA GGTGCCACTT ATATTACCTA CGTGAATTTC	60
TTGAATGAGC TACGAGTTAA ATTGAAACCC GAAGGTAACA GCCATGGAAT CCCATTGCTG	120
CGCAAAAAAT GTGATGATCC TGGAAAGTGT TTCGTTTG TAGCGCTTTC AAATGACAAT	180
GGACAGTTGG CGGAAATAGC TATAGATGTT ACAAGTGTGTT ATGTGGTGGG CTATCAAGTA	240
AGAAACAGAT CTTACTTCTT TAAAGATGCT CCAGATGCTG CTTACGAAGG CCTCTTCAAA	300
AACACAATTA AAACAAGACT TCATTTGGC GGCAGCTATC CCTCGCTGGA AGGTGAGAAG	360
GCATATAGAG AGACAACAGA CTTGGCATT GAACCATTAA GGATTGGCAT CAAGAAACTT	420
GATGAAAATG CGATAGACAA TTATAAACCA ACGGAGATAG CTAGTTCTCT ATTGGTTGTT	480
ATTCAAATGG TGTCTGAAGC AGCTCGATT ACCTTTATTG AGAACCAAAT TAGAAATAAC	540
TTTCAACAGA GAATTGGCCC GGCAGATAAT ACAATCAGCC TTGAGAATAA ATGGGGTAAA	600
CTCTCGTTCC AGATCCGGAC ATCAGGTGCA AATGGAATGT TTTGGAGGC AGTTGAATTG	660
GAACGTGCAA ATGGCAAAAA ATACTATGTC ACCGCAGTTG ATCAAGTAAA ACCCAAAATA	720
GCACCTTGGA AGTCGTCGA TAAAGATCCT AAAACGAGCC TTGCTGCTGA ATTGATAATC	780
CAGAACTATG AGTCATTAGT GGGCTTTGAT TAG	813

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 846 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

ATGGCGGCAA AGATGGCGAA GAACGTGGAC AAGCCGCTCT TCACCGCGAC GTTCAACGTC	60
CAGGCCAGCT CCGCCGACTA CGCCACCTTC ATCGCCGGCA TCCGCAACAA GCTCCGCAAC	120
CCGGCGCACT TCTCCCACAA CCGCCCCGTG CTGCCGCCGG TCGAGCCAA CGTCCCGCCG	180
AGCAGGTGGT TCCACGTCGT GCTCAAGGCC TCGCCGACCA GCGCCGGGCT CACGCTGGCC	240
ATCCGCGCGG ACAACATCTA CCTGGAGGGC TTCAAGAGCA GCGACGGCAC CTGGTGGGAG	300
CTCACCCCGG GCCTCATCCC CGGCGCCACC TACGTCGGGT TCGGCGGCAC CTACCGCGAC	360
CTCCTCGGCG ACACCGACAA GCTAACCAAC GTCGCTCTCG GCCGACAGCA GCTGGCGGAC	420
GCGGTGACCG CGCTCCACGG GCGCACCAAG GCCGACAAGG CCTCCGGCCC GAAGCAGCAG	480
CAGGCGAGGG AGGCGGTGAC GACGCTGGTC CTCATGGTGA ACGAGGCCAC GCGGTTCCAG	540
ACGGTGTCTG GGTCGTGGC CGGGTTGCTG CACCCCAAGG CGGTGGAGAA GAAGAGCGGG	600
AAGATCGGCA ATGAGATGAA GGCCCAGGTG AACGGGTGGC AGGACCTGTC CGCGCGCTG	660
CTGAAGACGG ACGTGAAGCC TCCGCCGGGA AAGTCGCCAG CGAAGTTCGC GCCGATCGAG	720
AAGATGGGCG TGAGGACGGC TGAACAGGCC GCCAACACGC TGGGGATCCT GCTGTTCGTG	780
GAGGTGCCGG GTGGGTTGAC GGTGGCCAAG GCGCTGGAGC TGTCCATGC GAGTGGTGGG	840
AAATAG	846

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 913 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

CGTCCGAAAA TGGTGAAATG CTTACTACTT TCTTTTTAA TTATGCCAT CTTCATTGGT	60
GTTCCTACTG CCAAAGGCGA TGTAACTTC GATTGTCGA CTGCCACTGC AAAAACCTAC	120

ACAAAATTAA TCGAAGAGATT CAGGGCGACT CTTCCATTAA GCCATAAAGT GTATGATATA	180
CCTCTACTGT ATTCCACTAT TTCCGACTCC AGACGTTCA TACTCCTCGA TCTTACAAGT	240
TATGCATATG AAACCATCTC GGTGGCCATA GATGTGACGA ACGTTATGT TGTGGCGTAT	300
CGCACCCGCG ATGTATCCTA CTTTTTAAA GAATCTCCTC CTGAAGCTTA TAACATCCTA	360
TTCAAAGGTA CGCGGAAAAT TACACTGCCA TATAACGGTA ATTATGAAAA TCTTCAAACT	420
GCTGCACACA AAATAAGAGA GAATATTGAT CTTGGACTCC CTGCCTTGAG TAGTGCCATT	480
ACACACATTGT TTTATTACAA TGCCCAATCT GCTCCTTCTG CATTGCTTGT ACTAATCCAG	540
ACGACTGCAG AAGCTGCAAG ATTTAAGTAT ATCGAGCGAC ACGTTGCTAA GTATGTTGCC	600
ACTAACTTTA AGCCAAATCT AGCCATCATA AGCTTGGAAA ATCAATGGTC TGCTCTCTCC	660
AACAAATCTT TTTGGCCAG AATCAAGGAG GAAAATTAG AAATCCTGTC GACCTTATAA	720
AACCTACCGG GGAACGGTTT CAAGTAACCA ATGTTGATTC AGATGTTGTA AAAGGTAATA	780
TCAAACCTCCT GCTGAACCTCC AGAGCTAGCA CTGCTGATGA AAACCTTATC ACAACCATGA	840
CTCTACTTGG GGAATCTGTT GTGAATTGAA AGTTAATAA TCCACCCATA TCGAAATAAG	900
GCATGTTCAT GAC	913

(2) INFORMATION FOR SEQ ID NO:14:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 32 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

TTYAARGAYG CNCCNGAYGC NGCNTAYGAR GG 32

(2) INFORMATION FOR SEQ ID NO:15:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 32 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

ACYTGRTCNA CNGCNGTNAC RTARTAYTTY TT

32

(2) INFORMATION FOR SEQ ID NO:16:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 32 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

GGNYTNGAYA CNGTNWSNTT YWSNACNAAR GG

32

(2) INFORMATION FOR SEQ ID NO:17:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

AATGGTTCAA TGCCCAAGTC TGT

23

(2) INFORMATION FOR SEQ ID NO:18:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

TGTCTCTCTA TATGCCTTCT CAC

23

(2) INFORMATION FOR SEQ ID NO:19:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 53 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

TCAACCCGGG CTAGATAACCG TGTCAATTCTC AACCAAAGGT GCCACTTATA TTA

53

(2) INFORMATION FOR SEQ ID NO:20:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

CTTCATTTG GCGGCACGTA TCC

23

(2) INFORMATION FOR SEQ ID NO:21:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 46 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

CTCGAGGCTG CAAGCTTACG TGGGATTTTT TTTTTTTTTT TTTTTT

46

(2) INFORMATION FOR SEQ ID NO:22:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

CTCGCTGGAA GGTGAGAA

18

(2) INFORMATION FOR SEQ ID NO:23:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 25 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

CTCGAGGCTG CAAGCTTACG TGGGA

25

(2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 35 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

TGATCTCGAG TACTATTTAG GATCTTATC GACGA

35

(2) INFORMATION FOR SEQ ID NO:25:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 22 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

GTAAGCAGCA TCTGGAGCAT CT

22

(2) INFORMATION FOR SEQ ID NO:26:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

CATTCAAGAA ATTCAACGTAG G

21

(2) INFORMATION FOR SEQ ID NO:27:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

GGCCTGGACA CCGTGAGCTT TAG

23

(2) INFORMATION FOR SEQ ID NO:28:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 25 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

TCGATTGCGA TCCTAAATAG TACTC

25

(2) INFORMATION FOR SEQ ID NO:29:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

TTTAGGATCG CAATCGACGA ACTTCAAG

28

(2) INFORMATION FOR SEQ ID NO:30:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 32 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

GTTCGTCTGT AAAGATCCTA AATAGTACTC GA

32

(2) INFORMATION FOR SEQ ID NO:31:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

GGATCTTAC AGACGAACCTT CAAGAGT

27

(2) INFORMATION FOR SEQ ID NO:32:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 25 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

TCTTGTGCTT CGTCGATAAA GATCC

25

(2) INFORMATION FOR SEQ ID NO:33:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

ATCGACGAAG CACAAGAGTG CTATTTC

27

(2) INFORMATION FOR SEQ ID NO:34:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 32 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

GTAAAACCAT GCATAGCACT CTTGAAGTTC GT

32

(2) INFORMATION FOR SEQ ID NO:35:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 32 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

AGTGCTATGC ATGGTTTAC TTGATCAACT GC

32

(2) INFORMATION FOR SEQ ID NO:36:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 29 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

AGCACATGTG GTGCCACTTA TATTACCTA

29

(2) INFORMATION FOR SEQ ID NO:37:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 33 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

TAAGTGGCAC CACATGTGCT AAAGCTCACG GTG

33

(2) INFORMATION FOR SEQ ID NO:38:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 25 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

TGACTGTGGA CAGTTGGCGG AAATA

25

(2) INFORMATION FOR SEQ ID NO:39:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 33 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

GCCAACTGTC CACAGTCATT TGAAAGCGCT ACC

33

(2) INFORMATION FOR SEQ ID NO:40:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 36 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

GATGATCCTG GAAAGGCTTT CGTTTGGTA GCGCTT

36

(2) INFORMATION FOR SEQ ID NO:41:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 41 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

AAGCCTTCAGGATCATCA GCTTTTGC GCAGCAATGG G

41

(2) INFORMATION FOR SEQ ID NO:42:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

AAGCCTTCAGGATCATCA CAT

23

(2) INFORMATION FOR SEQ ID NO:43:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

GCGACTCTCT ACTGTTTC

18

(2) INFORMATION FOR SEQ ID NO:44:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

CGTTAGCAAT TAACTGTGA T

21

(2) INFORMATION FOR SEQ ID NO:45:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 16 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

AACAGCTATG ACCATG

16

(2) INFORMATION FOR SEQ ID NO:46:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 30 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

TGAACTCGAG GAAAATCACC TATTTCCAC

30

(2) INFORMATION FOR SEQ ID NO:47:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

GCATTACATC CATGGCGGC

19

(2) INFORMATION FOR SEQ ID NO:48:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 64 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

GATATCTCGA GTTAAC TATT TCCCACCACA CGCATGGAAC AGCTCCAGCG CCTTGGCCAC	60
CGTC	64

(2) INFORMATION FOR SEQ ID NO:49:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

TGTCTGTTCG TGGAGGTGCC G	21
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(2) INFORMATION FOR SEQ ID NO:50:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

CCAAGTGTCT GGAGCTGTTCA CATGCGA	27
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(2) INFORMATION FOR SEQ ID NO:51:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 29 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

GATGTTAAYT TYGAYTTGTC NACDGCTAC

29

(2) INFORMATION FOR SEQ ID NO:52:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 29 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

ATTGGGNAGDG TAGCCCTRAA RTCYTCDAT

29

(2) INFORMATION FOR SEQ ID NO:53:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 32 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

GCCACTGCAA AACCTACAC AAAATTTATT GA

32

(2) INFORMATION FOR SEQ ID NO:54:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 22 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

GATGTTAACT TCGATTGTC GA

22

(2) INFORMATION FOR SEQ ID NO:55:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 33 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

TCAACTCGAG GTACTCAATT CACAACAGAT TCC

33

(2) INFORMATION FOR SEQ ID NO:56:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

Cys His His His Ala Ser Arg Val Ala Arg Met Ala Ser Asp Glu Phe
1 5 10 15

Pro Ser Met Cys
20

(2) INFORMATION FOR SEQ ID NO:57:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

Pro Ser Gly Gln Ala Gly Ala Ala Ser Glu Ser Leu Phe Ile Ser
1 5 10 15

Asn His Ala Tyr
20

(2) INFORMATION FOR SEQ ID NO:58:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 22 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

CAGCCATGGA ATCCCATTGC TG

22

(2) INFORMATION FOR SEQ ID NO:59:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 28 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

CACATGTAAA ACAAGACTTC ATTTTGGC

28

(2) INFORMATION FOR SEQ ID NO:60:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 36 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

TGAAGTCTTG TTTTAGATGT GTTTTGAAG AGGCCT

36

(2) INFORMATION FOR SEQ ID NO:61:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 30 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

ATGCCATATG CAATTATAAA CCAACGGAGA

30

(2) INFORMATION FOR SEQ ID NO:62:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 39 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

GGTTTATAAT TGCATATGGC ATTTTCATCA AGTTTCTTG

39

(2) INFORMATION FOR SEQ ID NO:63:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 33 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

CTTTCAACAA TGCATTCGCC CGGCGAATAA TAC

33

(2) INFORMATION FOR SEQ ID NO:64:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 33 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

GCGAATGCAT TGTTGAAAGT TATTCTAAC TTG

33

(2) INFORMATION FOR SEQ ID NO:65:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:65:

GTGGTGAG GCAGTTGAAT TGGAAC

26

(2) INFORMATION FOR SEQ ID NO:66:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 34 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:66:

TTCAACTGCC TCACAAAACA TTCCATTGAC ACCT

34

(2) INFORMATION FOR SEQ ID NO:67:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 24 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:67:

AAAAGCTGAT GATCCTGGAA AGTG

24

(2) INFORMATION FOR SEQ ID NO:68:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 35 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:68:

TCCAGGATCA TCAGCTTTT TGCGCAGCAA TGGGA

35

(2) INFORMATION FOR SEQ ID NO:69:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 321 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:69:

GACATCCAGA TGACTCAGTC TCCATCTTCC ATGTCTGCAT CTCTGGGAGA CAGAGTCACT 60

ATCACTTGCC GGGCGAGTCA GGACATTAAT AGCTATTAA GCTGGTTCCA GCAGAAACCA 120

GGGAAATCTC CTAAGACCCT GATCTATCGT GCAAACAGAT TGGTAGATGG GGTCCCATCA 180

AGGTTCAGTG GCAGTGGATC TGGGACAGAT TATACTCTCA CCATCAGCAG CCTGCAATAT 240

GAAGATTTTG GAATTTATTA TTGTCAACAG TATGATGAGT CTCCGTGGAC GTTCGGTGGA 300

GGCACCAAGC TTGAAATCAA A 321

(2) INFORMATION FOR SEQ ID NO:70:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 354 base pairs
 - (B) TYPE: nucleic acid

- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:70:

CAGATCCAGT TGGTGCAGTC TGGACCTGGC CTGAAGAACG CTGGAGGGTC CGTCAGAAC	60
TCCTGCGCAG CTTCTGGTA TACCTTCACA AACTATGGAA TGAACTGGGT GAAGCAGGCT	120
CCAGGAAAGG GTTTAAGGTG GATGGGCTGG ATAAACACCC ACACGGAGA GCCAACATAT	180
GCTGATGACT TCAAGGGACG GTTTACCTTC TCTTGACAGA CGTCTAAGAG CACTGCCTAT	240
TTACAGATCA ACAGCCTCAG AGCCGAGGAC ACGGCTACAT ATTTCTGTAC AAGACGGGGT	300
TACGACTGGT ACTTCGATGT CTGGGGCCAA GGGACCACGG TCACCGTCTC CTCC	354

(2) INFORMATION FOR SEQ ID NO:71:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 354 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

GAGATCCAGT TGGTGCAGTC TGGAGGAGGC CTGGTGAAGC CTGGAGGGTC CGTCAGAAC	60
TCCTGCGCAG CTTCTGGTA TACCTTCACA AACTATGGAA TGAACTGGGT GCGCCAGGCT	120
CCAGGAAAGG GTTTAGAGTG GATGGGCTGG ATAAACACCC ACACGGAGA GCCAACATAT	180
GCTGATTCTT TCAAGGGACG GTTTACCTTC TCTTGACAGA ATTCTAAGAA CACTGCCTAT	240
TTACAGATCA ACAGCCTCAG AGCCGAGGAC ACGGCTGTGT ATTTCTGTAC AAGACGGGGT	300
TACGACTGGT ACTTCGATGT CTGGGGCCAA GGGACCACGG TCACCGTCTC CTCC	354

(2) INFORMATION FOR SEQ ID NO:72:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 321 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:72:

GACATCCAGA TGACTCAGTC TCCATCTTCC CTGCTGCAT CTGTAGGAGA CAGAGTCACT	60
ATCACTTGCC GGGCGAGTCA GGACATTAAT AGCTATTAA GCTGGTTCCA GCAGAAACCA	120
GGGAAAGCTC CTAAGACCCT GATCTATCGT GCAAACAGAT TGGAATCTGG GGTCCCATCA	180
AGGTTCAGTG GCAGTGGATC TGGGACAGAT TATACTCTCA CCATCAGCAG CCTGCAATAT	240
GAAGATTTG GAATTATTA TTGTCAACAG TATGATGAGT CTCCGTGGAC GTTCGGTGGA	300
GGCACCAAGC TTGAAATCAA A	321

(2) INFORMATION FOR SEQ ID NO:73:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 70 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:73:

TGTCATCATC ATGCATCGCG AGTTGCCAGA ATGGCATCTG ATGAGTTCC TTCTATGTGC	60
GCAAGTACTC	70

(2) INFORMATION FOR SEQ ID NO:74:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 78 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:74:

TCGAGAGTAC TTGCGCACAT AGAAGGAAAC TCATCAGATG CCATTCTGGC AACTCGCGAT	60
GCATGATGAT GACATGCA	78

(2) INFORMATION FOR SEQ ID NO:75:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 30 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:75:

TGTCGGCCG CATGTCATCA TCATGCATCG

30

(2) INFORMATION FOR SEQ ID NO:76:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:76:

AGTCATGCC CGCGC

15

(2) INFORMATION FOR SEQ ID NO:77:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:77:

TCCCGGCTGT CCTACAGT

18

(2) INFORMATION FOR SEQ ID NO:78:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:78:

TCCAGCCTGT CCAGATGGTG TGTGAGTTT GTCACAA

37

(2) INFORMATION FOR SEQ ID NO:79:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 76 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:79:

CTAACTCGAG AGTACTGTAT GCATGGTCG AGATGAACAA AGATTCTGAG GCTGCAGCTC	60
CAGCCTGTCC AGATGG	76

(2) INFORMATION FOR SEQ ID NO:80:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:80:

CTAACTCGAG AGTACTGTAT	20
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(2) INFORMATION FOR SEQ ID NO:81:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 36 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:81:

TCCAGCCTGT CCAGATGGAC ACTCTCCCCT GTTGAA	36
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(2) INFORMATION FOR SEQ ID NO:82:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:82:

GTACAGTGGA AGGTGGAT	18
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(2) INFORMATION FOR SEQ ID NO:83:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:83:

CATGCGGCCG ATTTAGGATC TTTATCGACG A

31

(2) INFORMATION FOR SEQ ID NO:84:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 22 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:84:

AACATCCAGT TGGTGCAGTC TG

22

(2) INFORMATION FOR SEQ ID NO:85:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:85:

GAGGAGACGG TGACCGTGGT

20

(2) INFORMATION FOR SEQ ID NO:86:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 19 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:86:

GACATCAAGA TGACCCAGT

19

(2) INFORMATION FOR SEQ ID NO:87:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 21 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:87:

GTTTGATTTC AAGCTTGGTG C

21

(2) INFORMATION FOR SEQ ID NO:88:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:88:

ACTTCGGCCG CACCATCTGG ACAGGCTGGA G

31

(2) INFORMATION FOR SEQ ID NO:89:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 723 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:89:

GACATCCAGA TGACTCAGTC TCCATCTTCC CTGTCTGCAT CTGTAGGAGA CAGAGTCACT	60
ATCACTTGCC GGGCGAGTCA GGACATTAAT AGCTATTTAA GCTGGTTCCA GCAGAAACCA	120
GGGAAAGCTC CTAAGACCCT GATCTATCGT GCAAACAGAT TGGAATCTGG GGTCCCATCA	180
AGGTTCAGTG GCAGTGGATC TGGGACAGAT TATACTCTCA CCATCAGCAG CCTGCAATAT	240
GAAGATTTTG GAATTTATTA TTGTCAACAG TATGATGAGT CTCCGTGGAC GTTCGGTGGA	300
GGCACCAAGC TTGAGATGAA AGGTGGCGGT GGATCTGGTG GAGGTGGTC CGGAGGTGGA	360
GGATCTGAGA TCCAGTTGGT GCAGTCTGGA GGAGGCCTGG TGAAGCCTGG AGGGTCCGTC	420
AGAATCTCCT GCGCAGCTTC TGGGTATACC TTCACAAACT ATGGAATGAA CTGGGTGCGC	480
CAGGCTCCAG GAAAGGGTTT AGAGTGGATG GGCTGGATAA ACACCCACAC TGGAGAGCCA	540
ACATATGCTG ATTCTTCAA GGGACGGTTT ACCTTCTCTT TGGACGATTC TAAGAACACT	600
GCCTATTTAC AGATCAACAG CCTCAGAGCC GAGGACACGG CTGTGTATTT CTGTACAAGA	660
CGGGGTTACG ACTGGTACTT CGATGTCTGG GGCCAAGGGA CCACGGTCAC CGTCTCCTCA	720
TGA	723

(2) INFORMATION FOR SEQ ID NO:90:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 723 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:90:

GAGATCCAGT TGGTGCAGTC TGGAGGAGGC CTGGTGAAAGC CTGGAGGGTC CGTCAGAAC	60
TCCTGCGCAG CTTCTGGGTA TACCTTCACA AACTATGGAA TGAACTGGGT GCGCCAGGCT	120
CCAGGAAAGG GTTTAGAGTG GATGGGCTGG ATAAACACCC ACACGGAGA GCCAACATAT	180
GCTGATTCTT TCAAGGGACG GTTTACCTTC TCTTGGACG ATTCTAAGAA CACTGCCTAT	240
TTACAGATCA ACAGCCTCAG AGCCGAGGAC ACGGCTGTGT ATTTCTGTAC AAGACGGGT	300
TACGACTGGT ACTTCGATGT CTGGGGCCAA GGGACCACGG TCACCGTCTC CTCAGGTGGC	360
GGTGGATCTG GTGGAGGTGG GTCCGGAGGT GGAGGATCTG ACATCCAGAT GACTCAGTCT	420
CCATCTTCCC TGTCTGCATC TGTAGGAGAC AGAGTCACTA TCACATTGCCG GGCAGTCAG	480
GACATTAATA GCTATTTAAG CTGGTTCCAG CAGAAACCAG GGAAAGCTCC TAAGACCCCTG	540
ATCTATCGTG CAAACAGATT GGAATCTGGG GTCCCATCAA GGTCAGTGG CAGTGGATCT	600
GGGACAGATT ATACTCTCAC CATCAGCAGC CTGCAATATG AAGATTTGG AATTTATTAT	660
TGTCAACAGT ATGATGAGTC TCCGTGGACG TTCGGTGGAG GCACCAAGCT TGAGATGAAA	720
TGA	723

(2) INFORMATION FOR SEQ ID NO:91:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 51 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:91:

CGGACCCACC TCCACCAGAT CCACCGCCAC CTTTCATCTC AAGCTTGGTG C	51
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(2) INFORMATION FOR SEQ ID NO:92:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:92:

GACATCCAGA TGACTCAGT

19

(2) INFORMATION FOR SEQ ID NO:93:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 49 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:93:

GGTGGAGGTG GGTCCGGAGG TGGAGGATCT GAGATCCAGT TGGTGCAGT

49

(2) INFORMATION FOR SEQ ID NO:94:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 35 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:94:

TGTACTCGAG CCCATCATGA GGAGACGGTG ACCGT

35

(2) INFORMATION FOR SEQ ID NO:95:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 49 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:95:

GGTGGAGGTG GGTCCGGAGG TGGAGGATCT GACATCCAGA TGACTCAGT

49

(2) INFORMATION FOR SEQ ID NO:96:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:96:

TGTACTCGAG CCCATCATTT CATCTCAAGC TTGGTG

37

(2) INFORMATION FOR SEQ ID NO:97:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 22 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:97:

GAGATCCAGT TGGTGCAGTC TG

22

(2) INFORMATION FOR SEQ ID NO:98:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 49 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:98:

CGGACCCACC TCCACCAGAT CCACCGCCAC CTGAGGGAGAC GGTGACCGT

49

(2) INFORMATION FOR SEQ ID NO:99:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 251 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:99:

Gly Leu Asp Thr Val Ser Phe Ser Thr Lys Gly Ala Thr Tyr Ile Thr
1 5 10 15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly
35 40 45

Lys Ala Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
 225 230 235 240

Ala Leu Leu Lys Phe Val Asp Lys Asp Pro Lys
 245 250

(2) INFORMATION FOR SEQ ID NO:100:

- (i) SEQUENCE CHARACTERISTICS:

 - (A) LENGTH: 251 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:100:

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Ala Asp Asp Pro Gly
 35 40 45

Lys Cys Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu

85

90

95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Asp Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:101:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 251 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:101:

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Ala Asp Asp Pro Gly
 35 40 45

Lys Ala Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
 100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
 115 . 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
 130 135 . 140

Ile	Asp	Asn	Tyr	Lys	Pro	Thr	Glu	Ile	Ala	Ser	Ser	Leu	Leu	Val	Val
145							150					155			160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Asp Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:102:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 251 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:102:

Gly Leu Asp Thr Val Ser Phe Ser Thr Lys Gly Ala Thr Tyr Ile Thr
1 5 10 15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly
35 40 45

Lys Cys Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Cys Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:103:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 251 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:103:

Gly Leu Asp Thr Val Ser Phe Ser Thr Lys Gly Ala Thr Tyr Ile Thr
1 5 10 15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly
35 40 45

Lys Cys Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu

115

120

125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Asp Cys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:104:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 251 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:104:

Gly Leu Asp Thr Val Ser Phe Ser Thr Lys Gly Ala Thr Tyr Ile Thr
1 5 10 15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly
35 40 45

Lys Cys Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Cys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Asp Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:105:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 251 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:105:

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Lys Cys Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Cys Phe Val Asp Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:106:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 251 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:106

Gly Leu Asp Thr Val Ser Phe Ser Thr Cys Gly Ala Thr Tyr Ile Thr
1 5 10 15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly
35 40 45

Lys Cys Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val

145

150

155

160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Asp Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:107:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 251 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:107:

Gly Leu Asp Thr Val Ser Phe Ser Thr Lys Gly Ala Thr Tyr Ile Thr
1 5 10 15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly
35 40 45

Lys Cys Phe Val Leu Val Ala Leu Ser Asn Asp Cys Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Asp Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:108:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 251 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:108:

Gly Leu Asp Thr Val Ser Phe Ser Thr Lys Gly Ala Thr Tyr Ile Thr
1 5 10 15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly
35 40 45

Lys Cys Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Cys Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Asp Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:109:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 251 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:109:

Gly Leu Asp Thr Val Ser Phe Ser Thr Lys Gly Ala Thr Tyr Ile Thr

1

5

10

15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Cys Asp Asp Pro Gly
35 40 45

Lys Cys Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Cys Ile Arg Pro Ala Asn Asn Thr Ile

180

185

190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Asp Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:110:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 251 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:110:

Gly Leu Asp Thr Val Ser Phe Ser Thr Cys Gly Ala Thr Tyr Ile Thr
1 5 10 15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Ala Asp Asp Pro Gly
35 40 45

Lys Ala Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Asp Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:111:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 251 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:111:

Gly Leu Asp Thr Val Ser Phe Ser Thr Cys Gly Ala Thr Tyr Ile Thr
1 5 10 15

Tyr Val Asn Phe Leu Asn Glu Leu Arg Val Lys Leu Lys Pro Glu Gly
20 25 30

Asn Ser His Gly Ile Pro Leu Leu Arg Lys Lys Ala Asp Asp Pro Gly
35 40 45

Lys Ala Phe Val Leu Val Ala Leu Ser Asn Asp Asn Gly Gln Leu Ala
50 55 60

Glu Ile Ala Ile Asp Val Thr Ser Val Tyr Val Val Gly Tyr Gln Val
65 70 75 80

Arg Asn Arg Ser Tyr Phe Phe Lys Asp Ala Pro Asp Ala Ala Tyr Glu
85 90 95

Gly Leu Phe Lys Asn Thr Ile Lys Thr Arg Leu His Phe Gly Gly Ser
100 105 110

Tyr Pro Ser Leu Glu Gly Glu Lys Ala Tyr Arg Glu Thr Thr Asp Leu
115 120 125

Gly Ile Glu Pro Leu Arg Ile Gly Ile Lys Lys Leu Asp Glu Asn Ala
130 135 140

Ile Asp Asn Tyr Lys Pro Thr Glu Ile Ala Ser Ser Leu Leu Val Val
145 150 155 160

Ile Gln Met Val Ser Glu Ala Ala Arg Phe Thr Phe Ile Glu Asn Gln
165 170 175

Ile Arg Asn Asn Phe Gln Gln Arg Ile Arg Pro Ala Asn Asn Thr Ile
180 185 190

Ser Leu Glu Asn Lys Trp Gly Lys Leu Ser Phe Gln Ile Arg Thr Ser
195 200 205

Gly Ala Asn Gly Met Phe Ser Glu Ala Val Glu Leu Glu Arg Ala Asn
210 215 220

Gly Lys Lys Tyr Tyr Val Thr Ala Val Asp Gln Val Lys Pro Lys Ile
225 230 235 240

Ala Leu Leu Lys Phe Val Cys Lys Asp Pro Lys
245 250

(2) INFORMATION FOR SEQ ID NO:112:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 29 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:112:

TGATGCAGCC GACATCTCAA GCTTGGTGCG

29

(2) INFORMATION FOR SEQ ID NO:113:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 29 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

-200-

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:113:

TGATGCGGCC GACATCTCAA GCTTGGTGC

29

(2) INFORMATION FOR SEQ ID NO:114:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 38 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:114:

TCTAGGTAC CGTCTCCTCA CCATCTGGAC AGGCTGGA

38

(2) INFORMATION FOR SEQ ID NO:115:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 37 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:115:

TTCGAAGCTT GAGATGAAAC CATCTGGACA GGCTGGA

37

(2) INFORMATION FOR SEQ ID NO:116:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:116:

AGTCGTCGAC ACGATGGACA TGAGGAC

27

(2) INFORMATION FOR SEQ ID NO:117:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 98 base pairs

- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:117:

AGTCGTCGAC ACGATGGACA TGAGGACCCC TGCTCAGTTT CTTGGCATCC TCCTACTCTG	60
GTTTCCAGGT ATCAAATGTG ACATCCAGAT GACTCAGT	98

(2) INFORMATION FOR SEQ ID NO:118:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 79 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:118:

TCACTTGCCG GGCGAATCAG GACATTAATA GCTATTAAAG CTGGTTCCAG CAGAAACCAG	60
GGAAAGCTCC TAAGACCT	79

(2) INFORMATION FOR SEQ ID NO:119:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 80 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:119:

TGACTCGCCC GGCAAGTGAT AGTGACTCTG TCTCCTACAG ATGCAGACAG GGAAGATGGA	60
GACTGAGTCA TCTGGATGTC	80

(2) INFORMATION FOR SEQ ID NO:120:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 79 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:120:

GATCCACTGC CACTAACCT TGATGGGACC CCAGATTCCA ATCTGTTGC ACGATAGATC	60
AGGGTCTTAG GAGCTTCC	79

(2) INFORMATION FOR SEQ ID NO:121:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 82 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:121:

GGTCAGTGG CAGTGGATCT GGGACAGATT ATACTCTCAC CATCAGCAGC CTGCAATATG	60
AAGATTTGG AATTTATTAT TG	82

(2) INFORMATION FOR SEQ ID NO:122:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 82 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:122:

GTTGATTTC AAGCTTGGTG CCTCCACCGA ACGTCCACGG AGACTCATCA TACTGTTGAC	60
AATAATAAAT TCCAAAATCT TC	82

(2) INFORMATION FOR SEQ ID NO:123:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 107 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:123:

Asp Ile Lys Met Thr Gln Ser Pro Ser Ser Met Tyr Ala Ser Leu Gly			
1	5	10	15

Glu Arg Val Thr Ile Thr Cys Lys Ala Ser Gln Asp Ile Asn Ser Tyr		
20	25	30

Leu Ser Trp Phe His His Lys Pro Gly Lys Ser Pro Lys Thr Leu Ile
35 40 45

Tyr Arg Ala Asn Arg Leu Val Asp Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Gln Asp Tyr Ser Leu Thr Ile Ser Ser Leu Asp Tyr
65 70 75 80

Glu Asp Met Gly Ile Tyr Tyr Cys Gln Gln Tyr Asp Glu Ser Pro Trp
85 90 95

Thr Phe Gly Gly Thr Lys Leu Glu Ile Lys
100 105

(2) INFORMATION FOR SEQ ID NO:124:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 118 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:124:

Gln Ile Gln Leu Val Gln Ser Gly Pro Glu Leu Lys Lys Pro Gly Glu
1 5 10 15

Thr Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asn Tyr
20 25 30

Gly Met Asn Trp Val Lys Gln Ala Pro Gly Lys Gly Leu Arg Trp Met
35 40 45

Gly Trp Ile Asn Thr His Thr Gly Glu Pro Thr Tyr Ala Asp Asp Phe
50 55 60

Lys Gly Arg Phe Ala Phe Ser Leu Glu Thr Ser Ala Ser Thr Ala Tyr
65 70 75 80

Leu Gln Ile Asn Asn Leu Lys Asn Glu Asp Thr Ala Thr Tyr Phe Cys
85 90 95

Thr Arg Arg Gly Tyr Asp Trp Tyr Phe Asp Val Trp Gly Ala Gly Thr
100 105 110

Thr Val Thr Val Ser Ser
115

(2) INFORMATION FOR SEQ ID NO:125:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 107 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:125:

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Asp Ile Asn Ser Tyr
20 25 30

Leu Ser Trp Phe Gln Gln Lys Pro Gly Lys Ala Pro Lys Thr Leu Ile
35 40 45

Tyr Arg Ala Asn Arg Leu Glu Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser Ser Leu Gln Tyr
65 70 75 80

Glu Asp Phe Gly Ile Tyr Tyr Cys Gln Gln Tyr Asp Glu Ser Pro Trp
85 90 95

Thr Phe Gly Gly Thr Lys Leu Glu Ile Lys
100 105

(2) INFORMATION FOR SEQ ID NO:126:

- (i) SEQUENCE CHARACTERISTICS:

 - (A) LENGTH: 118 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:126:

Glu Ile Gln Leu Val Gln Ser Gly Gly Gly Leu Val Lys Pro Gly Gly
1 5 10 15

Ser Val Arg Ile Ser Cys Ala Ala Ser Gly Tyr Thr Phe Thr Asn Tyr
 20 25 30

Gly Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Met
35 40 45

Gly Trp Ile Asn Thr His Thr Gly Glu Pro Thr Tyr Ala Asp Ser Phe
50 55 60

Lys Gly Arg Phe Thr Phe Ser Leu Asp Asp Ser Lys Asn Thr Ala Tyr
 65 70 75 80

Leu Gln Ile Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Phe Cys
85 90 95

Thr Arg Arg Gly Tyr Asp Trp Tyr Phe Asp Val Trp Gly Gln Gly Thr
 100 105 110

Thr Val Thr Val Ser Ser
115

(2) INFORMATION FOR SEQ ID NO:127:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 280 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:127:

Ala Ala Lys Met Ala Lys Asn Val Asp Lys Pro Leu Phe Thr Ala Thr
1 5 10 15

Phe Asn Val Gln Ala Ser Ser Ala Asp Tyr Ala Thr Phe Ile Ala Gly
20 25 30

Ile Arg Asn Lys Leu Arg Asn Pro Ala His Phe Ser His Asn Arg Pro
35 40 45

Val Leu Pro Pro Val Glu Pro Asn Val Pro Pro Ser Arg Trp Phe His
50 55 60

Val Val Leu Lys Ala Ser Pro Thr Ser Ala Gly Leu Thr Leu Ala Ile
65 70 75 80

Arg Ala Asp Asn Ile Tyr Leu Glu Gly Phe Lys Ser Ser Asp Gly Thr
85 90 95

Trp Trp Glu Leu Thr Pro Gly Leu Ile Pro Gly Ala Thr Tyr Val Gly
100 105 110

Phe Gly Gly Thr Tyr Arg Asp Leu Leu Gly Asp Thr Asp Lys Leu Thr
115 120 125

Asn Val Ala Leu Gly Arg Gln Gln Leu Ala Asp Ala Val Thr Ala Leu

130

135

140

His Gly Arg Thr Lys Ala Asp Lys Ala Ser Gly Pro Lys Gln Gln Gln
145 150 155 160

Ala Arg Glu Ala Val Thr Thr Leu Val Leu Met Val Asn Glu Ala Thr
165 170 175

Arg Phe Gln Thr Val Ser Gly Phe Val Ala Gly Leu Leu His Pro Lys
180 185 190

Ala Val Glu Lys Lys Ser Gly Lys Ile Gly Asn Glu Met Lys Ala Gln
195 200 205

Val Asn Gly Trp Gln Asp Leu Ser Ala Ala Leu Leu Lys Thr Asp Val
210 215 220

Lys Pro Pro Pro Gly Lys Ser Pro Ala Lys Phe Ala Pro Ile Glu Lys
225 230 235 240

Met Gly Val Arg Thr Ala Glu Gln Ala Ala Asn Thr Leu Gly Ile Leu
245 250 255

Leu Phe Val Glu Val Pro Gly Gly Leu Thr Val Ala Lys Ala Leu Glu
260 265 270

Leu Phe His Ala Cys Gly Gly Lys
275 280

(2) INFORMATION FOR SEQ ID NO:128:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 280 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:128:

Ala Ala Lys Met Ala Lys Asn Val Asp Lys Pro Leu Phe Thr Ala Thr
1 5 10 15

Phe Asn Val Gln Ala Ser Ser Ala Asp Tyr Ala Thr Phe Ile Ala Gly
20 25 30

Ile Arg Asn Lys Leu Arg Asn Pro Ala His Phe Ser His Asn Arg Pro
35 40 45

Val Leu Pro Pro Val Glu Pro Asn Val Pro Pro Ser Arg Trp Phe His
50 55 60

Val Val Leu Lys Ala Ser Pro Thr Ser Ala Gly Leu Thr Leu Ala Ile
65 70 75 80

Arg Ala Asp Asn Ile Tyr Leu Glu Gly Phe Lys Ser Ser Asp Gly Thr
85 90 95

Trp Trp Glu Leu Thr Pro Gly Leu Ile Pro Gly Ala Thr Tyr Val Gly
100 105 110

Phe Gly Gly Thr Tyr Arg Asp Leu Leu Gly Asp Thr Asp Lys Leu Thr
115 120 125

Asn Val Ala Leu Gly Arg Gln Gln Leu Ala Asp Ala Val Thr Ala Leu
130 135 140

His Gly Arg Thr Lys Ala Asp Lys Ala Ser Gly Pro Lys Gln Gln Gln
145 150 155 160

Ala Arg Glu Ala Val Thr Thr Leu Val Leu Met Val Asn Glu Ala Thr
165 170 175

Arg Phe Gln Thr Val Ser Gly Phe Val Ala Gly Leu Leu His Pro Lys
180 185 190

Ala Val Glu Lys Lys Ser Gly Lys Ile Gly Asn Glu Met Lys Ala Gln
195 200 205

Val Asn Gly Trp Gln Asp Leu Ser Ala Ala Leu Lys Thr Asp Val
210 215 220

Lys Pro Pro Pro Gly Lys Ser Pro Ala Lys Phe Ala Pro Ile Glu Lys
225 230 235 240

Met Gly Val Arg Thr Ala Glu Gln Ala Ala Asn Thr Leu Gly Ile Leu
245 250 255

Leu Phe Val Glu Val Pro Gly Gly Leu Thr Val Ala Lys Cys Leu Glu
260 265 270

Leu Phe His Ala Ser Gly Gly Lys
275 280

(2) INFORMATION FOR SEQ ID NO:129:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 280 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:129:

Ala Ala Lys Met Ala Lys Asn Val Asp Lys Pro Leu Phe Thr Ala Thr
1 5 10 15

Phe Asn Val Gln Ala Ser Ser Ala Asp Tyr Ala Thr Phe Ile Ala Gly
20 25 30

Ile Arg Asn Lys Leu Arg Asn Pro Ala His Phe Ser His Asn Arg Pro
35 40 45

Val Leu Pro Pro Val Glu Pro Asn Val Pro Pro Ser Arg Trp Phe His
50 55 60

Val Val Leu Lys Ala Ser Pro Thr Ser Ala Gly Leu Thr Leu Ala Ile
65 70 75 80

Arg Ala Asp Asn Ile Tyr Leu Glu Gly Phe Lys Ser Ser Asp Gly Thr
85 90 95

Trp Trp Glu Leu Thr Pro Gly Leu Ile Pro Gly Ala Thr Tyr Val Gly
100 105 110

Phe Gly Gly Thr Tyr Arg Asp Leu Leu Gly Asp Thr Asp Lys Leu Thr
115 120 125

Asn Val Ala Leu Gly Arg Gln Gln Leu Ala Asp Ala Val Thr Ala Leu
130 135 140

His Gly Arg Thr Lys Ala Asp Lys Ala Ser Gly Pro Lys Gln Gln Gln
145 150 155 160

Ala Arg Glu Ala Val Thr Thr Leu Val Leu Met Val Asn Glu Ala Thr
165 170 175

Arg Phe Gln Thr Val Ser Gly Phe Val Ala Gly Leu Leu His Pro Lys
180 185 190

Ala Val Glu Lys Lys Ser Gly Lys Ile Gly Asn Glu Met Lys Ala Gln
195 200 205

Val Asn Gly Trp Gln Asp Leu Ser Ala Ala Leu Leu Lys Thr Asp Val
210 215 220

Lys Pro Pro Pro Gly Lys Ser Pro Ala Lys Phe Ala Pro Ile Glu Lys
225 230 235 240

Met Gly Val Arg Thr Ala Glu Gln Ala Ala Asn Thr Leu Gly Ile Cys
245 250 255

Leu Phe Val Glu Val Pro Gly Gly Leu Thr Val Ala Lys Ala Leu Glu
260 265 270

Leu Phe His Ala Ser Gly Gly Lys
275 280

(2) INFORMATION FOR SEQ ID NO:130:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:130:

Ser Cys Asp Lys Thr His Thr
1 5

(2) INFORMATION FOR SEQ ID NO:131:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 85 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:131:

TGTCGACATC ATGGCTTGGG TGTGGACCTT GCTATTCCCTG ATGGCAGCTG CCCAAAGTGC 60

CCAAGCAGAG ATCCAGTTGG TGCAG 85

(2) INFORMATION FOR SEQ ID NO:132:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 86 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:132:

AAGGTATAACC CAGAACGCTGC GCAGGGAGATT CTGACGGACC CTCCAGGCTT CACCAGGCCT	60
CCTCCAGACT GCACCAACTG GATCTC	86

(2) INFORMATION FOR SEQ ID NO:133:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 84 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:133:

GCAGCTTCTG GGTATACCTT CACAAACTAT GGAATGAACT GGGTGCGCCA GGCTCCAGGA	60
AAGAATTTCAG AGTGGATGGG CTGG	84

(2) INFORMATION FOR SEQ ID NO:134:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 85 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:134:

AAAGAGAAGG TAAACCGTCC CTTGAAAGAA TCAGCATATG TTGGCTCTCC AGTGTGGGTG	60
TTTATCCAGC CCATCCACTC TAAAC	85

(2) INFORMATION FOR SEQ ID NO:135:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 87 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:135:

GACGGTTTAC CTTCTCTTG GACGATTCTA AGAACACTGC CTATTTACAG ATCAACAGCC	60
TCAGAGCCGA GGACACGGCT GTGTATT	87

(2) INFORMATION FOR SEQ ID NO:136:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 92 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:136:

GAGGAGACGG TGACCGTGGT CCCTTGGCCC CAGACATCGA AGTACCAGTC GTAACCCCGT	60
CTTGTACAGA AATACACAGC CGTGTCTCG GC	92

(2) INFORMATION FOR SEQ ID NO:137:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 84 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:137:

GCAGCTTCTG GGTATAACCTT CACAAACTAT GGAATGAACT GGGTGAAGCA GGCTCCAGGA	60
AAGGGTTTAA GGTGGATGGG CTGG	84

(2) INFORMATION FOR SEQ ID NO:138:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 85 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:138:

AAAGAGAAGG TAAACCGTCC CTTGAAGTCA TCAGCATATG TTGGCTCTCC AGTGTGGGTG	60
TTTATCCAGC CCATCCACCT TAAAC	85

(2) INFORMATION FOR SEQ ID NO:139:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 84 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:139:

GACGGTTTAC CTTCTCTTG GACACGTCTA AGTGCAGTC CTATTTACAG ATCAACAGCC 60
TCAGAGCCGA GGACACGGCT ACAT 84

(2) INFORMATION FOR SEQ ID NO:140:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 91 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:140:

AGGAGACGGT GACCGTGGTC CCTTGGCCCC AGACATCGAA GTACCAGTCG TAACCCCGTC 60
TTGTACAGAA ATATGTAGCC GTGTCCTCGG C 91

(2) INFORMATION FOR SEQ ID NO:141:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 80 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:141:

TGACTCGCCC GGCAAGTGAT AGTGACTCTG TCTCCCAGAC ATGCAGACAT GGAAGATGAG 60
GACTGAGTCA TCTGGATGTC 80

(2) INFORMATION FOR SEQ ID NO:142:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 79 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:142:

TCACTTGCCG GGCGAGTCAG GACATTAATA GCTATTAAAG CTGGTTCCAG CAGAAACCAG 60
GGAAATCTCC TAAGACCCCT 79

(2) INFORMATION FOR SEQ ID NO:143:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 79 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:143:

GATCCACTGC CACTGAACCT TGATGGGACC CCATCTACCA ATCTGTTGC ACCATAGATC 60
AGGGTCTTAG GAGATTCC 79

(2) INFORMATION FOR SEQ ID NO:144:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 85 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:144:

TGTCGACATC ATGGCTTGGG TGTGGACCTT GCTATTCTG ATGGCAGCTG CCCAAAGTGC 60
CCAAGCACAG ATCCAGTTGG TGCAG 85

(2) INFORMATION FOR SEQ ID NO:145:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 85 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:145:

AAGGTATACC CAGAACGCTGC GCAGGGAGATT CTGACGGACC CTCCAGGCTT CTTCAGGCCA 60
GGTCCAGACT GCACCAACTG GATCT 85

(2) INFORMATION FOR SEQ ID NO:146:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:146:

ACTAGTGTCG ACATCATGGC TTGGGT

26

(2) INFORMATION FOR SEQ ID NO:147:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 240 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:147:

Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Ser	Leu	Ser	Ala	Ser	Val	Gly
1										10				15	
Asp	Arg	Val	Thr	Ile	Thr	Cys	Arg	Ala	Ser	Gln	Asp	Ile	Asn	Ser	Tyr
				20				25					30		
Leu	Ser	Trp	Phe	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys	Thr	Leu	Ile
				35			40					45			
Tyr	Arg	Ala	Asn	Arg	Leu	Glu	Ser	Gly	Val	Pro	Ser	Arg	Phe	Ser	Gly
				50		55				60					
Ser	Gly	Ser	Gly	Thr	Asp	Tyr	Thr	Leu	Thr	Ile	Ser	Ser	Leu	Gln	Tyr
				65		70			75				80		
Glu	Asp	Phe	Gly	Ile	Tyr	Tyr	Cys	Gln	Gln	Tyr	Asp	Glu	Ser	Pro	Trp
				85			90				95				
Thr	Phe	Gly	Gly	Thr	Lys	Leu	Glu	Met	Lys	Gly	Gly	Gly	Ser		
				100			105				110				
Gly	Gly	Gly	Ser	Gly	Gly	Ser	Glu	Ile	Gln	Leu	Val	Gln			
				115		120			125						
Ser	Gly	Gly	Gly	Leu	Val	Lys	Pro	Gly	Gly	Ser	Val	Arg	Ile	Ser	Cys
				130		135			140						
Ala	Ala	Ser	Gly	Tyr	Thr	Phe	Thr	Asn	Tyr	Gly	Met	Asn	Trp	Val	Arg
				145			150			155			160		

Gln Ala Pro Gly Lys Gly Leu Glu Trp Met Gly Trp Ile Asn Thr His
165 170 175

Thr Gly Glu Pro Thr Tyr Ala Asp Ser Phe Lys Gly Arg Phe Thr Phe
180 185 190

Ser Leu Asp Asp Ser Lys Asn Thr Ala Tyr Leu Gln Ile Asn Ser Leu
195 200 205

Arg Ala Glu Asp Thr Ala Val Tyr Phe Cys Thr Arg Arg Gly Tyr Asp
210 215 220

Trp Tyr Phe Asp Val Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
225 230 235 240

(2) INFORMATION FOR SEQ ID NO:148:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 240 amino acids
- (B) TYPE: amino acid
- (C) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:148:

Glu Ile Gln Leu Val Gln Ser Gly Gly Gly Leu Val Lys Pro Gly Gly
1 5 10 15

Ser Val Arg Ile Ser Cys Ala Ala Ser Gly Tyr Thr Phe Thr Asn Tyr
20 25 30

Gly Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Met
35 40 45

Gly Trp Ile Asn Thr His Thr Gly Glu Pro Thr Tyr Ala Asp Ser Phe
50 55 60

Lys Gly Arg Phe Thr Phe Ser Leu Asp Asp Ser Lys Asn Thr Ala Tyr
65 70 75 80

Leu Gln Ile Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Phe Cys
85 90 95

Thr Arg Arg Gly Tyr Asp Trp Tyr Phe Asp Val Trp Gly Gln Gly Thr
100 105 110

Thr Val Thr Val Ser Ser Gly Gly Ser Gly Gly Gly Ser
115 120 125

Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu
130 135 140

Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln
145 150 155 160

Asp Ile Asn Ser Tyr Leu Ser Trp Phe Gln Gln Lys Pro Gly Lys Ala
165 170 175

Pro Lys Thr Leu Ile Tyr Arg Ala Asn Arg Leu Glu Ser Gly Val Pro
180 185 190

Ser Arg Phe Ser Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile
195 200 205

Ser Ser Leu Gln Tyr Glu Asp Phe Gly Ile Tyr Tyr Cys Gln Gln Tyr
210 215 220

Asp Glu Ser Pro Trp Thr Phe Gly Gly Thr Lys Leu Glu Met Lys
225 230 235 240

(2) INFORMATION FOR SEQ ID NO:149:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 107 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:149:

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Xaa Ile Ser Xaa Tyr
20 25 30

Leu Xaa Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Ala Ser Xaa Leu Xaa Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Xaa Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr Xaa Xaa Xaa Pro Xaa
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105

(2) INFORMATION FOR SEQ ID NO:150:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 108 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:150:

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly
1 5 10 15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Ser Ser
20 25 30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu
35 40 45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Arg Leu Glu
65 70 75 80

Pro Gly Asp Phe Ala Val Tyr Tyr Cys Gln Gln Tyr Gly Ser Ser Pro
85 90 95

Xaa Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105

(2) INFORMATION FOR SEQ ID NO:151:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 108 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:151:

Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly
1 5 10 15

Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu Asn Asn
20 25 30

Tyr Leu Asn Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Gln Leu Leu
35 40 45

Ile Tyr Leu Gly Ser Asn Arg Ala Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Val Glu
65 70 75 80

Ala Glu Asp Val Gly Val Tyr Tyr Cys Met Gln Ala Leu Gln Xaa Pro
85 90 95

Xaa Thr Phe Gly Gln Gly Thr Lys Xaa Glu Ile Lys
100 105

(2) INFORMATION FOR SEQ ID NO:152:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 106 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:152:

Xaa Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Ile Gly Xaa Asn Xaa
20 25 30

Val Xaa Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Asn Asn Arg Pro Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Lys
50 55 60

Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln Ser Glu Asp
65 70 75 80

Glu Ala Asp Tyr Tyr Cys Ala Thr Trp Asp Asp Ser Leu Asp Pro Val
85 90 95

Phe Gly Gly Thr Lys Thr Val Leu Gly
100 105

(2) INFORMATION FOR SEQ ID NO:153:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 104 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:153:

Xaa Ser Ala Leu Thr Gln Pro Ala Ser Val Ser Gly Ser Pro Gly Gln
1 5 10 15

Ser Ile Thr Ile Ser Cys Thr Gly Thr Ser Ser Val Gly Tyr Asn Xaa
20 25 30

Val Ser Trp Tyr Gln Gln His Pro Gly Lys Ala Pro Lys Leu Ile Tyr
35 40 45

Asp Val Arg Pro Ser Gly Val Arg Phe Ser Gly Ser Lys Ser Gly Asn
50 55 60

Thr Ala Ser Leu Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys Ser Ser Tyr Xaa Gly Xaa Xaa Xaa Val Phe Gly Gly
85 90 95

Gly Thr Lys Leu Thr Val Leu Gly
100

(2) INFORMATION FOR SEQ ID NO:154:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 100 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:154:

Ser Tyr Glu Leu Thr Gln Pro Pro Ser Val Ser Val Ser Pro Gly Gln
1 5 10 15

Thr Ala Ile Thr Cys Ser Gly Asp Xaa Leu Xaa Xaa Xaa Tyr Val Xaa
20 25 30

Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr Asp
35 40 45

Arg Pro Ser Gly Ile Pro Gln Arg Phe Ser Gly Ser Ser Thr Thr Ala
50 55 60

Thr Leu Thr Ile Ser Gly Val Gln Ala Asp Glu Ala Asp Tyr Tyr Cys
65 70 75 80

Gln Xaa Trp Asp Xaa Xaa Val Val Phe Gly Gly Gly Thr Lys Leu
85 90 95

Thr Val Leu Gly
100

(2) INFORMATION FOR SEQ ID NO:155:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 106 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:155:

Asn Phe Met Leu Thr Gln Pro His Ser Val Ser Glu Ser Pro Gly Lys

1	5	10	15
Thr Val Thr Ile Ser Cys Thr Xaa Ser Xaa Gly Ile Ala Ser Xaa Tyr			
20	25	30	
Val Gln Trp Tyr Gln Gln Arg Pro Gly Ser Ala Pro Thr Thr Val Ile			
35	40	45	
Tyr Glu Asp Asn Arg Pro Ser Gly Val Pro Asp Arg Phe Ser Gly Ser			
50	55	60	
Ser Ser Asn Ser Ala Ser Leu Thr Ile Ser Gly Leu Lys Thr Glu Asp			
65	70	75	80
Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Asp Ser Xaa Xaa Trp Val Phe			
85	90	95	
Gly Gly Gly Thr Lys Leu Thr Val Leu Gly			
100	105		

(2) INFORMATION FOR SEQ ID NO:156:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 107 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:156:

Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ala Val Ser Leu Gly			
1	5	10	15
Glu Arg Ala Thr Ile Asn Cys Lys Ser Ser Gln Ser Val Leu Lys Asn			
20	25	30	
Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu			
35	40	45	
Ile Tyr Trp Ala Ser Arg Glu Ser Gly Val Pro Asp Arg Phe Ser Gly			
50	55	60	
Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Ala			
65	70	75	80
Gln Asp Val Ala Val Tyr Tyr Cys Gln Gln Tyr Tyr Ser Thr Pro Xaa			
85	90	95	
Thr Phe Gly Gln Gly Thr Lys Xaa Gly Ile Lys			
100	105		

(2) INFORMATION FOR SEQ ID NO:157:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 105 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:157:

Ser	Glu	Leu	Thr	Gln	Pro	Pro	Ser	Val	Ser	Val	Ala	Pro	Gly	Gln	Thr
1				5				10						15	
Arg	Ile	Thr	Cys	Ser	Gly	Asp	Xaa	Leu	Gly	Xaa	Tyr	Asp	Ala	Xaa	Trp
						20			25					30	
Tyr	Gln	Gln	Lys	Pro	Gly	Gln	Ala	Pro	Leu	Leu	Val	Ile	Tyr	Gly	Arg
						35			40				45		
Asn	Arg	Pro	Ser	Gly	Ile	Pro	Asp	Arg	Phe	Ser	Gly	Ser	Ser	Ser	Gly
					50			55				60			
His	Thr	Ala	Ser	Leu	Thr	Ile	Thr	Gly	Ala	Gln	Ala	Glu	Asp	Glu	Ala
					65			70			75			80	
Asp	Tyr	Tyr	Cys	Asn	Ser	Arg	Asp	Ser	Ser	Gly	Lys	Val	Leu	Phe	Gly
					85			90					95		
Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	Gly							
					100			105							

(2) INFORMATION FOR SEQ ID NO:158:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 96 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:158:

Ser	Ala	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Ser	Pro	Gly	Gln	Ser
1					5				10					15	
Val	Thr	Ile	Ser	Cys	Thr	Gly	Thr	Ser	Ser	Val	Gly	Xaa	Xaa	Tyr	Val
					20				25				30		
Ser	Trp	Tyr	Gln	Gln	His	Gly	Ala	Pro	Lys	Ile	Glu	Val	Arg	Pro	Ser
					35				40				45		
Gly	Val	Pro	Asp	Arg	Phe	Ser	Gly	Ser	Lys	Ser	Asn	Thr	Ala	Ser	Leu
					50			55				60			
Thr	Val	Ser	Gly	Leu	Ala	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Ser	Ser
					65			70			75		80		
Tyr	Xaa	Xaa	Xaa	Xaa	Phe	Val	Phe	Gly	Gly	Thr	Lys	Thr	Val	Leu	
					85			90				95			

(2) INFORMATION FOR SEQ ID NO:159:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 119 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:159:

Glu	Val	Gln	Leu	Val	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1				5				10					15		
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Xaa	Xaa
	20							25					30		
Xaa	Met	Xaa	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu-Trp	Val	
	35							40				45			
Xaa	Xaa	Ile	Xaa	Xaa	Xaa	Xaa	Xaa	Gly	Xaa	Xaa	Tyr	Ala	Asp	Ser	Val
	50							55				60			
Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asp	Ser	Lys	Asn	Thr	Leu	Tyr
	65						70				75		80		
Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
		85						90					95		
Ala	Arg	Xaa	Trp	Gly	Gln	Gly									
		100						105					110		
Thr	Leu	Val	Thr	Val	Ser	Ser									
		115													

(2) INFORMATION FOR SEQ ID NO:160:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 119 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:160:

Gln	Val	Gln	Leu	Val	Gln	Ser	Gly	Ala	Glu	Val	Lys	Lys	Pro	Gly	Xaa
1				5					10				15		
Ser	Val	Xaa	Val	Ser	Cys	Lys	Xaa	Ser	Gly	Tyr	Tyr	Phe	Xaa	Xaa	Tyr
	20							25					30		
Xaa	Ile	Xaa	Trp	Val	Arg	Gln	Ala	Pro	Gly	Xaa	Gly	Leu	Glu	Trp	Val
	35							40				45			
Gly	Xaa	Ile	Xaa	Pro	Xaa	Xaa	Gly	Xaa	Thr	Xaa	Tyr	Ala	Pro	Xaa	Phe
	50						55					60			

Gln Gly Arg Val Thr Xaa Thr Arg Asp Xaa Ser Xaa Asn Thr Ala Tyr
65 70 75 80

Met Glu Leu Xaa Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Trp Gly Gln Gly
100 105 110

Thr Leu Val Thr Val Ser Ser
115

(2) INFORMATION FOR SEQ ID NO:161:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 117 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:161:

Xaa Val Thr Leu Xaa Glu Ser Gly Pro Xaa Leu Val Leu Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu, Thr Cys Thr Val Ser Gly Xaa Ser Leu Ser Xaa Xaa
20 25 30

Xaa Val Xaa Trp Ile Arg Gln Pro Pro Gly Lys Xaa Leu Glu Trp Leu
35 40 45

Ala Xaa Ile Xaa Xaa Asp Asp Asp Xaa Tyr Xaa Thr Ser Leu Arg Ser
50 55 60

Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val Val Leu Xaa
65 70 75 80

Xaa Xaa Xaa Xaa Asp Pro Xaa Asp Thr Ala Thr Tyr Tyr Cys Ala Arg
85 90 95

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asp Val Trp Gly Gln Gly Thr Thr
100 105 110

Val Thr Val Ser Ser
115

(2) INFORMATION FOR SEQ ID NO:162:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 107 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: not relevant
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:162:

Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Ser Ile Asn Thr Trp
20 25 30

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Met
35 40 45

Tyr Lys Ala Ser Ser Leu Glu Ser Gly Val Pro Ser Arg Phe Ile Gly
50 55 60

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Asp Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr Asn Ser Asp Ser Lys
85 90 95

Met Phe Gly Gln Gly Thr Lys Val Glu Val Lys
100 105

(2) INFORMATION FOR SEQ ID NO:163:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 106 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:163:

Gln Ile Val Leu Thr Gln Ser Pro Ala Ile Met Ser Ala Ser Pro Gly
1 5 10 15

Glu Lys Val Thr Ile Thr Cys Ser Ala Ser Ser Ser Ile Ser Tyr Met
20 25 30

His Trp Phe Gln Gln Lys Pro Gly Thr Ser Pro Lys Leu Trp Ile Tyr
35 40 45

Thr Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser Gly Ser
50 55 60

Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Met Glu Ala Glu
65 70 75 80

Asp Ala Ala Thr Tyr Tyr Cys His Gln Arg Ser Thr Tyr Pro Leu Thr
85 90 95

Phe Gly Ser Gly Thr Lys Leu Glu Leu Lys
100 105

(2) INFORMATION FOR SEQ ID NO:164:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 106 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:164:

Asp	Ile	Gln	Leu	Thr	Gln	Ser	Pro	Ser	Ser	Met	Ser	Ala	Ser	Pro	Gly
1					5					10					15
Asp	Arg	Val	Thr	Ile	Thr	Cys	Arg	Ala	Ser	Ser	Ser	Ile	Ser	Tyr	Met
				20					25					30	
His	Trp	Phe	Gln	Gln	Lys	Pro	Gly	Lys	Ser	Pro	Lys	Leu	Trp	Ile	Tyr
				35				40						45	
Thr	Thr	Ser	Asn	Leu	Ala	Ser	Gly	Val	Pro	Ser	Arg	Phe	Ser	Gly	Ser
				50				55			60				
Gly	Ser	Gly	Thr	Ser	Tyr	Thr	Leu	Thr	Ile	Ser	Ser	Met	Gln	Ala	Glu
				65			70			75				80	
Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	His	Gln	Arg	Ser	Thr	Tyr	Pro	Leu	Thr
				85				90						95	
Phe	Gly	Gln	Gly	Thr	Lys	Leu	Glu	Leu	Lys						
				100				105							

(2) INFORMATION FOR SEQ ID NO:165:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 106 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:165:

Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Thr	Leu	Ser	Ala	Ser	Val	Gly
1					5				10					15	
Asp	Arg	Val	Thr	Ile	Thr	Cys	Ser	Ala	Ser	Ser	Ser	Ile	Ser	Tyr	Met
				20				25						30	
His	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys	Leu	Leu	Ile	Tyr
				35				40						45	
Thr	Thr	Ser	Asn	Leu	Ala	Ser	Gly	Val	Pro	Ala	Arg	Phe	Ser	Gly	Ser
				50				55			60				

Gly	Ser	Gly	Thr	Glu	Phe	Thr	Leu	Thr	Ile	Ser	Ser	Leu	Gln	Pro	Asp
65				70					75				80		
Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	His	Gln	Arg	Ser	Thr	Tyr	Pro	Leu	Thr
	85					90						95			
Phe	Gly	Gln	Gly	Thr	Lys	Val	Glu	Val	Lys						
	100						105								

(2) INFORMATION FOR SEQ ID NO:166:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 117 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: not relevant
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:166:

Gln	Val	Gln	Leu	Val	Gln	Ser	Gly	Ala	Glu	Val	Lys	Lys	Pro	Gly	Ser
1				5					10				15		
Ser	Val	Lys	Val	Ser	Cys	Lys	Ala	Ser	Gly	Gly	Thr	Phe	Ser	Arg	Ser
	20					25					30				
Ala	Ile	Ile	Trp	Val	Arg	Gln	Ala	Pro	Gly	Gln	Gly	Leu	Glu	Trp	Met
	35				40					45					
Gly	Gly	Ile	Val	Pro	Met	Phe	Gly	Pro	Pro	Asn	Tyr	Ala	Gln	Lys	Phe
	50				55					60					
Gln	Gly	Arg	Val	Thr	Ile	Thr	Ala	Asp	Glu	Ser	Thr	Asn	Thr	Ala	Tyr
	65				70				75			80			
Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Glu	Asp	Thr	Ala	Phe	Tyr	Phe	Cys
	85					90				95					
Ala	Gly	Gly	Tyr	Gly	Ile	Tyr	Ser	Pro	Glu	Glu	Tyr	Asn	Gly	Gly	Leu
	100					105					110				
Val	Thr	Val	Ser	Ser											
	115														

(2) INFORMATION FOR SEQ ID NO:167:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 116 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:167:

Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Leu Ala Lys Pro Gly Ala
1 5 10 15

Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
20 25 30

Arg Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Ile Asn Pro Ser Thr Gly Tyr Thr Glu Tyr Asn Gln Lys Phe
50 55 60

Lys Asp Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr
65 70 75 80

Met Gln Leu Ser Ser Leu Thr Phe Glu Asp Ser Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Gly Gly Val Phe Asp Tyr Trp Gly Gln Gly Thr Thr Leu
100 105 110

Thr Val Ser Ser
115

(2) INFORMATION FOR SEQ ID NO:168:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 116 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:168:

Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Val Ala Lys Pro Gly Ala
1 5 10 15

Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
20 25 30

Arg Met His Trp Val Lys Gln Ala Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Ile Asn Pro Ser Thr Gly Tyr Thr Glu Tyr Asn Gln Lys Phe
50 55 60

Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr
65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Gly Gly Val Phe Asp Tyr Trp Gly Gln Gly Thr Thr Leu
100 105 110

Thr Val Ser Ser
115

(2) INFORMATION FOR SEQ ID NO:169:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 116 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:169:

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
 20 25 30

Arg Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Ile Asn Pro Ser Thr Gly Tyr Thr Glu Tyr Asn Gln Lys Phe
 50 55 60

Lys Asp Lys Ala Thr Ile Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr
 65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95

Ala Arg Gly Gly Val Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
 100 105 110

Thr Val Ser Ser
 115